Review Comments
Basis of Design Report – Groundwater Source Control Measure
Premier Edible Oils Site
Portland, Oregon
Dated July 2015
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Following are the United States Environmental Protection Agency's (EPA) comments on the July 2015 document entitled, Basis of Design Report – Groundwater Source Control Measure, Premier Edible Oils Site, Portland, Oregon (BOD report) prepared by ERM-West, Inc. (ERM) for MMGL Corp. The Premier Edible Oils (PEO) site is located at 10400 N. Burgard Way, Portland, Oregon and is listed in DEQ's cleanup program as ESCI #2013.

EPA understands the purpose of the BOD report is to present the basis of design for the proposed groundwater source control measure, which consists of a groundwater barrier wall and an oxygenation/biobarrier system. The BOD report was prepared pursuant to the Voluntary Agreement for Upland Remedial Investigation/Feasibility Study and Source Control Measures issued by the Oregon Department of Environmental Quality (ODEQ) and signed 6 March 2001 (ODEQ ECDVC-NWR-01-06) (Voluntary Agreement).

General Comments

1. EPA understands that due to slope constraints, the alignment of the groundwater barrier wall will be setback 20 feet inland of the top of the riverbank, leaving a "stranded wedge" of light non-aqueous phase liquid (LNAPL) and related contaminants outside of the barrier wall, uncontained, adjacent to the Willamette River. The BOD report should evaluate the feasibility of source control measures to address this area and provide justification on why source control is not planned for contaminants in this area.

2. The BOD report includes no information on effect of the proposed groundwater barrier wall on groundwater flow direction and lateral migration of LNAPL, dissolved TPH, and related contaminants. Construction of the barrier wall will potentially result in groundwater mounding on the upgradient side of the wall, which would result in lateral movement of LNAPL and dissolved contaminants potentially around the ends of the wall. An evaluation of the effect of the barrier wall on groundwater and contaminant movement should be added to the BOD report. Contingency measures to address lateral movement of LNAPL and dissolved contaminants along and around the barrier wall should be included in the design.

3. The purpose of the groundwater barrier wall, as stated in Section 2.3, is to prevent potential migration of LNAPL and dissolved phase TPH to the Willamette River; however, the proposed barrier wall alignment depicted in Figure 3 is not of sufficient length to prevent LNAPL and dissolved TPH from reaching the river. Specifically, LNAPL and related contaminants were detected at wells MW-18 and MW-24 at concentrations exceeding the Portland Harbor

Preliminary Remediation Goals (PRGs). These wells are located at or beyond the proposed endpoints of the groundwater barrier wall; therefore, contaminants detected at these wells are not expected to be completely captured by the barrier wall. The proposed extent of the barrier wall appears to be based only on the most recent monitoring data from June 2015 as no other recent monitoring data is provided. Based on data presented in the 30 January 2013 Southern PEO Investigation Technical Memorandum (Treadwell & Rollo 2013) the following contaminants were detected at MW-18 and MW-24:

- At MW-18 a sheen was observed and TPH-gasoline was detected at 190 micrograms per liter (µg/L). The current PRG for TPH (C10-C12 alphatic) is 2.6 µg/L (RAO 8).

- At MW-24, TPH-gasoline was detected at 28 µg/L, exceeding the PRG (RAO 8).

The most recent groundwater monitoring data, in addition to the June 2015 data, should be included in tables and figures of the BOD report to determine if the June 2015 data is representative of current conditions and the barrier wall design should be updated, if needed. The proposed barrier wall alignment should be extended to capture contaminants detected at MW-18 and MW-24 or the BOD report should provide an explanation of how contaminants detected at concentrations exceeding the PRGs in these areas will be addressed.

4. As stated in Section 2.2.2, the extent of dissolved arsenic is larger than the extent of the LNAPL plume; however, the conceptual extent of the oxygenation/biobarrier area shown in Figure 3 appears to be limited to the location of the LNAPL plume. Based on data presented in Treadwell & Rollo 2013, dissolved arsenic exceeds the PRG at wells MW-18 and MW-24, which are located at and near the limit of the conceptual extent of the oxygenation/biobarrier area. For example, the 2012 dissolved arsenic concentration at MW-18 was 0.61 µg/L, which exceeds the PRG (RAO 4) of 0.02 µg/L. The BOD report should identify the area that is impacted by arsenic exceeding the PRG, present criteria for what areas will be included in the oxygenation/biobarrier treatment area, and discuss how areas with dissolved arsenic exceeding the PRG will be addressed.

5. EPA understands that design, permitting, and construction contracting for the groundwater barrier wall is currently underway, before completion of the groundwater source control evaluation and before completion of the conceptual design for the oxygenation/biobarrier system. The introduction of the BOD report should provide an overview of the upcoming key decision and design documents for the groundwater source control and explain how decisions made in these documents will affect the design of the groundwater barrier wall.

6. The results of the bench scale slurry testing are an important part of the basis of design and should be provided in the BOD report.

7. Design decisions such as type of slurry wall construction and slurry mix design are to be provided by the contractor. EPA requests the opportunity to review and comment on the contractor's selected slurry wall construction method, slurry mix bench scale tests, and final slurry mix selection.

8. Source control remedial action objectives (RAOs) and numerical groundwater cleanup levels (CULs) should be provided and used in the BOD report. These are critical in evaluation of the basis of design of the groundwater source control method.

Specific Comments

Basis of Design Report

1. Section 1.1.2, Page 2, paragraph 2 – This paragraph should reference the documents under which the groundwater source control remedy was developed and the DEQ decision document (i.e., the 2014 Revised Feasibility Study and DEQ's 2014 Recommended Alternative for LNAPL and Groundwater Source Control).

2. Section 2.1, Page 4, last paragraph – This paragraph should specify the timing of the submittal of the Upland Transition Zone Water Investigation Report and Source Control Evaluation and the design of the groundwater barrier wall. The SCE report submittal date should be included on the schedule in Appendix C. Clarification should be provided on how the exposure pathway evaluation, the evaluation of the potential applicability of the Portland Harbor RAOs, and the PRGs that will be presented in the SCE report will affect the BOD report and final design.

3. Section 2.2.2, Page 5, first paragraph – This paragraph references the map in Figure 3 and the lateral extent of LNAPL relative to the former tank farm; however, the location of the former tank farm is not shown in Figure 3 or any other figures in the BOD report. Recommend adding the location of the former tank farm to Figure 3. The extent of LNAPL, based on representative data of the current LNAPL extent, should also be shown in Figure 3.

4. Section 2.2.2, Page 5, last paragraph – Figures showing the extent of dissolved TPH, benzene, chloroethenes, polyaromatic hydrocarbons (PAHs), arsenic, and manganese should be presented to support the discussion of the extent of groundwater impacts. Without presentation of this information, the basis of design of the groundwater source control measure cannot be evaluated.

5. Section 2.4.1.1, Page 7 – The presence of underground utilities or large debris could affect the design of the groundwater barrier wall. If a utility survey along the barrier wall alignment has not been completed yet, EPA recommends that one be conducted soon so that changes can be made prior to construction.

6. Section 2.4.3, Page 8, fourth paragraph – The maximum *in situ* hydraulic conductivity requirement for the groundwater barrier wall is not specified in this section. The BOD report should provide this value and a rationale for why the value is sufficient to provide an effective barrier to prevent migration of LNAPL and dissolved TPH to the river. Both the wall thickness and the maximum *in situ* hydraulic conductivity should factor into this evaluation.

7. Section 2.4.5, Page 9 – The LNAPL distribution shown in Figure 3 is based on the gauging results from the June 2015 monitoring event. Supporting data should be presented showing the historical LNAPL thickness over time for each of the wells in Figure 3. The historical data will show variability in LNAPL thickness at each well including seasonal variations. EPA review of the LNAPL thickness data presented in the 30 January 2013 Southern PEO Investigation

Technical Memorandum (Treadwell & Rollo 2013) indicated significant variations in the LNAPL thickness between measurements collected in April 2012 and August 2012. For example, the LNAPL thickness at MW-12 was 0.27 feet in April 2012 and 1.28 feet in August 2012 and at MW-18, a sheen was observed in April 2012 and no LNAPL was observed in August 2012. Review of the historical LNAPL thickness at each of these wells will determine if the June 2015 measurements shown in Figure 3 are representative of year-round conditions at these wells or biased by seasonal variation.

8. Section 5.0, Page 14, first paragraph – The performance monitoring plan for the groundwater barrier wall should be completed as part of the barrier wall design because performance monitoring and contingency measures are a critical design component. According to the schedule presented in Appendix C, the draft performance monitoring plan will not be completed until 26 February 2016, which is 8 months after completion of the groundwater barrier wall construction. Due to the potential for the groundwater barrier wall to cause lateral LNAPL and dissolved contaminant migration around the wall, performance monitoring should be commenced immediately following completion of construction. The results of performance monitoring should be available to trigger contingency measures, if needed.

Groundwater Barrier Wall Technical Specifications:

1. Section 01430-1.05 – This section should include a reference to Contaminated Materials Management Plan in Appendix B for contaminated water and soil handling, testing, and disposal requirements.

2. Section 01700 – Specify that the Contractor shall provide well abandonment records to the OWNER and regulatory agencies per OAR Section 690 Division 240.

3. Section 02200-1.01.D – Specify that the Contractor shall not use potentially contaminated soil on site. Representative soil samples should be collected of any soil used as backfill demonstrating that contaminant concentrations are below the PRGs.

4. Section 02242-1.04.D – Specify which ODEQ stormwater requirements will be included.

5. Section 02242-2.05.D – The contractor is allowed to reuse soil from the trench if it "meets the specifications." Add a reference or provide the actual "specifications."

6. Section 02250-1.02.C- Specify which ODEQ off-site disposal policies will be included.

7. Attachments A through E are referenced but not included with the specifications. Include these attachments and clearly identify them as Attachments A through E. Of particular concern is Attachment E, which is the slurry treatability study. EPA reserves the opportunity to review the slurry treatability study to confirm suitability of site conditions for slurry wall technology.

8. Drawing Sheet 3, Notes 8 and 9 – Note 8 indicates that alternate alignments of the turn in the barrier wall are allowed, but Note 9 indicates that no deviation greater than 5 feet is allowed. Please clarify whether Note 9 supersedes Note 8.

9. Drawing Sheet 4, Note 7 – What defines a storm event should be provided.

10. Drawing Sheet 4 – Stabilization is needed of the gap between the decontamination pad/tire wash and the street.